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ABSTRACT

Critical research issues that need to be addressed by postsecondary education in the 1980s are discussed. Among the technologically-related issues are the following: the impact of computer-assisted and computer-managed approaches on learning processes, and the compatibility of degree attainment with the labor market. Issues pertaining to enrollments, student characteristics, and finances include: federal/state role in projecting enrollments, the potential of an increased influence of state funding agencies on postsecondary education, changes in the role of community colleges, reduced fiscal capacity of colleges, the impact of increasing numbers of older students, achieving increased representation of minorities in postsecondary education, black studies and affirmative action, and achieving increased representation of females and minorities in faculty and administrative appointments. Additional issues include: curriculum assessment in teacher education, certification requirements and competency testing, professional educational preparation, the impact of intercollegiate athletics on academic standards, problems relating to growing industry-university collaboration, and effects of faculty unionization. An annotated bibliography is appended. (SW)

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JAMES MADISON UNIVERSITY
Social Science Research Center

CRITICAL RESEARCH ISSUES IN POSTSECONDARY EDUCATION IN THE 1980s

A Study Done for the
Office of Educational Research and Improvement
NATIONAL INSTITUTE OF EDUCATION

Based on the research by Lillian P. Jennings, Donna Stewart, Marcella A. Smith, and L. L. Wohlfarth

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CRITICAL RESEARCH ISSUES IN POSTSECONDARY EDUCATION IN THE 1980s

I. TECHNOLOGICALLY RELATED ISSUES

Impact of New Technology on Learning Processes in Postsecondary Education: CAI and CMI Approaches

The primary need for research in this area relates to the impact of computer technology on management, instruction, and learning in institutions of higher education and in preparation of elementary and secondary teachers at colleges and universities to make the best use of computer technology during their own careers.

The need for such research appears to be much more keenly felt in the latter context than the former. In higher education, over half of the students using computers are concentrated in three departments: computer science, engineering, and business (35). The overall response of post-secondary instructors--except for those teaching in these three areas, along with teacher education--to the possibilities of instructional programs and classroom management techniques in which computers are used appears to be sporadic and generally tepid, while the positive response of grade-school teachers approaches unanimity (50).

In one 1980 study, 92 percent of a sample population of K-12 teachers, student teachers and teacher educators rated the need for imparting "computer literacy" to students by the time of high school graduation as extremely important; only six percent of the same group rated themselves qualified to teach "computer literacy" (51). "Computer literacy" means different things to different commentators, but a common denominator appears to include some experience in computer usage, basic programming skills, and some knowledge of the applications of computer-based skills and information (35).

It follows then that research is needed to determine the effectiveness of different types of computer use, alone or in combination with traditional methods, in educational settings. The highest priority should be given to testing their effectiveness at the grade-school level, where the greatest need is felt for expanding and

improving their use, for the purpose of determining how teachers should be trained in colleges and universities (31). Only in this way can postsecondary institutions educate teachers in uses of computer technology which have been proven to be appropriate and beneficial. Several frameworks for research methodology in this sort of evaluation have been suggested (12). Methods have been proposed even for evaluating the indirect economic (7), political, social and cultural impacts of computer use in education (30).

To break the suggested analysis down a bit further, the effectiveness of computer use in two broad areas of application needs to be analyzed: Computer-Assisted (or Computer-Augmented) Instruction (CAI) and Computer-Managed Instruction (CMI). There is obviously some overlap between these areas, and considerable confusion is likely because the second term is not used by its protagonists in the way laymen would expect, but, as used by most writers and those otherwise offering testimony in the field, the division is roughly the following.

CAI is instruction administered by a computer, usually in the form of packages for courses (32): it presents information to students at their own pace and also tests them in a fashion which allows them to proceed at an individual rate of achievement, rather than simply being part of a group which moves forward at the same pace under methods of group instruction using standard textbooks and other material common to the entire group. It can apply either modular, stand-alone microcomputers or larger central computers used on a time-sharing basis (10). While originally designed for more factual learning, CAI has been successfully used in the humanities, even for stimulating invention in English composition (11). In spite of its versatile applicability in many frames of reference, CAI appears to be a more sophisticated extension of realm of the older "teaching-machine," which was one of the first mechanical devices used in instructional technology and which at the time of its inception was not generally thought of as a computer.

The underlying rationale of CAI is efficiency of production, with units of learning being the items produced, whether the units are low-level factual question/answer sequences (54) or fairly abstract designs for concept attainment (29). Obviously, then, it can be used to accelerate what for roughly the last fifteen years in post-secondary education has been called CHP (Credit-Hour Production) at all levels of education.

Those who stress a need for expanding CMI argue that the CAI approach is too mechanistic and treats schools too much as factories. While the term, "Computer-Managed Instruction" might conjure up an image of a heightened degree of "Computer-Assisted Instruction," current CMI advocates tend to look with some suspicion upon CAI proponents because of the latters' alleged conviction that the more learning units are mastered the more educational goals are achieved. CMI proponents would like to shift the emphasis on computer use to one in which the computer increasingly takes over the clerical, routine functions of teaching, such as recordkeeping, test-generation, test-correction, and data procurement (2,39), leaving teachers larger amounts of free time to relate to their students on an individual basis and to enable instructors "upwardly to integrate" their students' knowledge into achievement of broader educational goals.

Such assertions and attempts at classification raise nearly as many questions as they answer, but that should be just fine from the standpoint of researching issues in post-secondary education. The point for the moment is to clarify the questions raised and determine if and how they can be answered by research.

The first question under this heading is: How valid is the attribution of a school-as-factory mental set to those favoring the CAI approach? Is it, in fact, true that they favor the mastering of a maximum number of units by a maximum number of students as the sole goal of CAI? This is the sort of thing which could be researched on a questionnaire basis, sampling those in the field who are teaching or using CAI methods. If the answer is essentially "No," then the further question can be asked and answered: What additional utility is seen in this approach, and how well is CAI functioning to achieve those additional goals (28)?

If, on the other hand, the first answer is essentially "Yes," then it is up to CMI proponents to make a case for their goal of using time made free through CMI applications for the purpose of achieving "upward integration" (broad educational goals). Here we are obviously into the sphere of values, which is a little trickier place to be in assessing the impact of technology on post-secondary education, but there is no reason to believe that some very useful values clarification could not be reached through systematically sampling the responses of those who advocate those values.

Obvious questions under this heading would include: What goals, apart from the imparting of information, does the CMI advocate envision teachers working towards with their students in the time freed by CMI usage? Probably (to judge by the existing literature) first answers would be vapid and platitudinous--on the order of "making the student feel good about himself," "allowing the student to achieve the total integration of his personality," etc.--but it should not be beyond the scope of researchers' ingenuity to elicit enough subsequent illustrations from respondents as to (a) whether there is real substance in the professed goals and, if there is, (b) whether this involves imparting some type of philosophy or capacity to interpret knowledge to students; if so, then (c) what sort of philosophy and what sort of interpretive capacity; further, (d) how is this (are these) to be imparted: personal instruction by the teacher, reference to books, use of free time for introspection, use of CAI elements, and, if none of these, how else?

Even with the most optimistic preliminary assessment of CAI and CMI approaches to learning, it seems certain that applying them in a post-secondary environment cannot be done without retention of traditional elements of instruction. It has been persuasively argued that even in the design of computer-based instructional development projects, it is necessary to fall back on "art, intuition, and personal experience" (15). A study completed more than twenty years ago concluded that conventional teaching methods using direct classroom instruction produced better understanding and retention by students than comparable televised instruction (45). More recent research tends towards findings of "no difference" between computer-based and traditional modes of instruction (42), but the caveat remains that substantially more research needs to be done in this area (12).

Impact of New Technology on the Compatibility of Degree Attainment with the Labor Market

The opening of new fields of occupational endeavor as the result of technological advances, coupled with the drying up of employment opportunities in superseded modes of production, is a phenomenon at least as old as the Industrial Revolution. The last several decades, however, have seen an acceleration in this trend, particularly affecting positions sought by graduates of post-secondary institutions of education: for more than a decade classified sections of major newspapers have been offering plenty

of employment opportunities for more graduates than exist in newer, technical fields, while the real-life graduates of colleges and universities often find themselves prepared for career opportunities which are no longer there.

In the past, attempts to predict labor markets for the planning purposes of educational institutions have sometimes produced disasterous results: one of the reasons for the glut of teachers in traditional disciplines at the end of the 1960s and beginning of the 1970s was media stress, prompted by estimates of educators and educational administrators, on the existing teacher shortage. These were combined with exhortations to young people to enter upon teaching careers. Somewhat later, the need for urban planners was greatly overestimated in post-secondary educational circles. All this notwithstanding, both the optimum utilization of institutional resources in times of financial retrenchment and the standing goal of preparing graduates for real employment opportunities demand that some research efforts be focused on predicting the labor market of the mid- and late-1980s. It has been said often enough that "forecasting" is all that research can do, while forecasting is not "predicting" in the social sciences; however, since forecasting is all that institutions of higher learning have to go on in planning for the future, forecasts will continue to be used as predictions in spite of the caveats of researchers, in the same way that people planning outdoor events treat weather forecasts as predictions in the absence of anything else (52). The expense of new technologically related programs requires an avoidance of any unnecessary duplication or overlap both within institutions and among institutions of higher learning related through either geographical proximity or (in the case of state colleges and universities) membership in the same system (4).

Post-secondary institutions will have to develop updated, cost-effective programs to meet the demands of new technology. This can be done only with ongoing assessment of the impact of this technology on the labor market. The task of acquiring data for such a wide field as the labor market is a gigantic one, but two approaches for research could profitably be used: much more could be made of a combination of data available from employment agencies and college placement services, to pinpoint both areas of increasing and decreasing employment opportunity; at the same time, on the basis of some variation of stratified quota sampling, employers in all sectors of the economy could be surveyed as to their present and projected employment needs.

When areas of present and future employment opportunity for graduates are identified in studies which integrate the impact of new technology with forecasts stressing demographic and economic factors, post-secondary educational institutions will have to test their programs as they go along both for their ability actually to meet the market and for cost-effectiveness.

There are numerous model systems for pursuing technological assessment with or without evaluating side effects or "second-order consequences" (12,30). These range from "anasynthesis," a combination of analysis, synthesis, modeling, and simulation, which has roots in electrical engineering but which has been used with claims of success to evaluate and update educational programs since 1963 (48), to "adversary evaluation" (3,12) in which program administrators are expected to defend each element of their educational units and methodology against hostile questions and claims from all possible angles, including political ones. Heretofore, such models have been applied more often to business and governmental studies than to higher education, where they now seem equally appropriate. While the schematics for research in business and academia are sometimes quite different because of discrepant goals and values, this is not the case here: meeting the market, updating programs, and achieving cost-effectiveness are aims shared by business and academia in this particular context of research projects.

II. ENROLLMENTS, STUDENT BODY MAKE-UP AND FINANCES

Federal/State Role in Projecting Enrollments

Although there is general agreement that enrollments at post-secondary educational institutions will continue to decline at least through the 1980s, the distribution of the decline appears much less certain (19,22). It appears likely that the major responsibility for making projections regarding coming enrollments will belong to the states; however, there may well be a federal role in ascertaining which methodologies state agencies should use, in order to insure the highest degree of accuracy. The type of data to be used will range from demographic material (birth rate, population shifts among regions, etc.) to projections of those jobs needing to be filled in different branches of the economy, which will affect the enrollments of certain types of institutions of higher education much more sharply than others (18,19,52).

Research efforts could be profitably expended in determining which data mix has yielded the most accurate results in making enrollment predictions for various types of institutions of higher education. Since a major variable in determining numbers of students who may pursue higher education in successive years is the state of the economy generally and the financial accessibility of college education to students, it will be necessary to factor into the research some overall assessment of the ability of state and private institutions of higher education to continue offering those programs at tuition and other cost levels which students can afford.

Evaluation of Possible Increased Influence of State Funding Agencies on Post-secondary Education

As federal aid to institutions of higher education is diminished, state funding agencies will be regarded as the source of additional funds. In this role, state legislatures and other state agencies will increasingly find themselves in a position to exercise greater influence over the future of both public and private institutions (22).

Basic research needs to be done here in ascertaining to what extent needs should be met within at least two possible frames of reference: (1) if states are assumed to be responsible for picking up the costs of previously federally funded programs; (2) if it is assumed that states are not financially in a position to take over the costs of previously federally financed programs en masse. In the latter case, evaluative research will become imperative to determine which of the terminated programs have been most effective and consequently most deserving of state funding with the limited resources of the states and how much of the cost states can expect to pass on to students receiving the benefits of higher education.

The factor of greater state influence is itself a very sensitive but significant subject area for research. A matter of concern to some administrators' and faculty groups at the moment is the type of "strings" which may be attached to state funding in coming years. There is perhaps a natural tendency on the part of such groups to pose questions on this topic in a fashion which implies that there is a threat to the quality of education from the impending intrusion of state legislatures and funding agencies into more levels of the educational process (13, 19,25); however, this is only one way of approaching the matter. It would seem to be equally possible that greater

accountability could lead to higher competency requirements for students, different (not necessarily more: perhaps fewer or alternate) certification requirements for teachers, and more stringent standards for institutional accreditation. These, if properly implemented, could enhance the quality of education.

Basic research in this area could at least partly ascertain the relationship (if any) between a greater financial "pinch" felt in funding for higher education and a greater impact of the state legislature or funding agency in question for the setting of such standards as those noted above. Beyond this, attempts should be made to evaluate the effectiveness of legislative and agency efforts to exert more influence on aspects of higher education. This type of research is certainly not easy, nor is it even possible on a short-term basis. Evaluating the effectiveness of programs in higher education means in essence evaluating the educations of students who come out of them. In most instances, this can be done only with regard to persons who have put their education to use for a measurable period of time. It is simply not known whether more state directives will enhance or detract from university mission and program integrity (1). There is not even any agreement on how to test with any accuracy in this area. Nonetheless, it would appear to be extremely worthwhile to attempt to undertake this sort of evaluation, although feelings and suspicions are running high on several sides at the moment and it would require a good deal of methodological trial and error at the outset.

Likely Change in the Role of Community Colleges

One of the areas in which substantial change can be expected for the next decade is in the area of community college roles. Present indications are that community colleges are more subject to change than four-year institutions for several reasons: tenure is much less of a factor (sometimes simply non-existent) at community colleges, which makes the restructuring of their faculties much easier to implement than at four-year colleges; the cumulative effect of their lobbying efforts and the influence of their alumni groups appears to be much less than that of four-year institutions; and their justification in terms of community service has a degree of immediacy in it not generally found in four-year colleges, which makes resistance to new program implementations and deletions much less than in most universities.

With community colleges most susceptible to change, particularly the type of change imposed by circumstances and outside authority (as opposed to internally generated efforts at change in the form of expansion and upgrading of missions and resources), research would be quite useful to determine the most generally desirable future roles they should have. For example, in these days of declining enrollments it might seem self-suggesting to think of contracting the scope of community colleges and even closing some of them, since there will be more than enough room in four-year colleges for most students qualified to receive post-secondary education; there is certainly nothing to prevent four-year colleges from giving more associate or two-year degrees. Traditional four-year colleges have already begun to compete with two-year colleges in offering vocational programs or others of limited scope (13).

On the other hand, the opposite trend might be more beneficial: if it is ascertained that community post-secondary educational needs are felt in the areas to be served as vocational and of a type for which two years of learning are sufficient, while total student financial resources have decreased along with total governmental financial resources for education, then expanding the role of community colleges at the expense of traditional post-secondary institutions could be justified. This would amount to encouraging a continuation of the trend of the 1970s; in the ten-year period ending in 1978, two-year institutions took an increasingly larger percentage of higher education enrollments (22).

Basic research here would involve extensive cost-benefit analysis, not only on CHP in community colleges contrasted with that of four-year, general liberal arts colleges, but also on the relative quality of the education offered. The inevitable subjectivity regarding quality is not an insuperable obstacle. There are standards of competency and performance. The question of felt-need satisfaction is also answerable: Is the type of education under consideration that which is desired by citizens of the community in which the post-secondary institution is based and by those who have received their education or vocational training from it?

Evaluation of Reduced Fiscal Capacity of Post-secondary Educational Institutions

Related to, but still separate from, the problem of declining enrollments is the matter of meeting educational

budgets in an age of scarcer resources. It would appear that, if present trends continue and the federal government reduces its funding further, states will assume more of the costs of running institutions of higher education but will also have to charge students more for attending them. This is, in fact, already happening (16). Here research would be useful to determine how much of the burden can be shifted to students before the objection comes into play that deserving students are unable to pursue an education commensurate with their abilities because of too high costs, or put more crudely, that higher education will be "only for the rich." The whole area of student loans could stand objective examination in this connection, and significant research can probably be done with data which will become available in the next year or so concerning the federal government's new efforts to collect defaulted loans. Obviously, a system in which those unable to pay for their educations are first assisted through loans and, through repayments with interest, later make future funds available for succeeding generations of students is the goal here, but considerable actuarial research needs to establish the future viability of such a system.

All indications are that costs for institutions of higher education will continue to rise in the next decade, which will continue to have a particularly strong impact on many private institutions of higher education (22). As a whole, the private sector of American post-secondary education is threatened by the effects of declining enrollments in a very uneven way (33). While it is true that state institutions of higher education have public revenues to fall back on in times of economic retrenchment, while private institutions by definition do not, it is also true that there are much wider discrepancies in the resources of private institutions than of public ones. On one hand, the well-reputed ivy-league schools, those which are well-endowed from alumni or church sources, and those specializing in research and technological development, appear to be currently less affected by economic crisis than those of the public sector, while "others" are much more affected (33,19). It is a matter of some priority to identify the relative vulnerability of different types of private colleges and universities to increasing economic pressures. It may be possible to isolate the factors which contribute to the viability or non-viability of different kinds of private institutions of higher learning in an age of economic stringency, apart from the obvious criteria of endowments or the success of annual giving programs.

As enrollments decline, the competition for students between the private and public sectors will be close. Individual public institutions can be expected to step up their recruiting efforts to keep from being affected by this national trend, and private schools will be threatened by such increased recruiting efforts. Preliminary studies suggest that options are open to the private institutions, as well as to state planners, to insure that increasing portions of the student population are not merely transferred from the private sector, but that the resources available in both private and public institutions are utilized most effectively (33). The options must be identified, prioritized and effectively implemented, if private institutions are to survive the competition, and for this to be done detailed research on types of possibilities will be necessary.

Some research also appears warranted to determine the most effective use of governmental funds in aiding private colleges. For example, how effective have different state programs which provide some sort of tuition assistance to those attending private colleges been in alleviating the straitened circumstances of private colleges caught between rising costs and declining enrollments? Is this sort of direct assistance to students or their parents better utilized than assistance to the institutions themselves? From a purely theoretical standpoint there should be no difference: money given to private institutions logically could be used to hold down or reduce costs in a way which would keep tuition lower; however, empirical research needs to be done, in order to determine whether this is true in fact as well as theory.

Projecting Impact of Increasing Numbers of Older Students

In the face of overall declining enrollments, the number of "older" (over twenty-five years of age) students in post-secondary but still undergraduate education appears to have held steady and even increased during the 1970s in some areas. The percentage of college students in the fourteen to thirty-four years age bracket who were twenty-five or older increased from 22.2 percent to 26.2 percent between 1973 and 1978 (22). The percentage of students over thirty-five increased from 8.8 percent to 11.7 percent during the same period (53).

Here there are two separate questions to be investigated: that of future numbers and that of anticipated effects of these numbers. Numerical projections could

probably be refined by constructing profiles of typical older-student types, particularly their motivation for pursuing post-secondary education later than other students, and correlating the results with more demographic data.

Getting a statistical handle on the motivational aspect of older-student enrollment is all-important before proceeding to the area of effects. At the moment, it is not clear whether the typical older student is one who wants largely to update his vocational skills for possible job advancement or one who wants (particularly in part-time, evening class settings) educational enrichment beyond his vocational interests. It is likely that very diverse sets of factors will come into play in defining a multiplicity of older-student types, the proportions of which will vary by region and by individual campus. When more clarity regarding the motivations and academic interests of older students is achieved and numerical projections have been made, it will be possible to research the coming impact on post-secondary institutions, so that curriculum revision can be planned and implemented if it appears that substantial changes will be needed.

Achieving Desired Increases in Minority-Group Representation in Student Bodies at Institutions of Higher Education

More minority-group students are enrolled in higher education than ever before in the United States (22). And yet, it really does not require any research at the moment to demonstrate that attempts to increase minority representation at those institutions of higher education which have had few minority students earlier have had very uneven records of success, while corresponding efforts to induce larger white enrollments at largely black colleges have been among the most abject failures of educational directive efforts in the last fifteen years. Some research, however, appears warranted to determine what factors have had an at least partly ameliorating effect in either or both contexts. How successful have special scholarships been in attracting desired students in ethnic categories? Has the practice of "shading" academic admission requirements been widespread, and, if so, what have been the consequences? Is there any measure which has been successful in attracting black students to colleges in an environment where there is virtually no black community?

On the negative side, the threat of withdrawal of federal funds has certainly been keenly felt by administrators in institutions of higher education, but it is not

known to what degree the threat or application of sanctions has resulted in bringing about the desired changes. Here, too, a study is called for, to establish what the actual effects of threats and sanctions have been.

Black Studies, Affirmative Action, and Goals of Integration

Partly as a recruitment mechanism for black faculty and students and partly as a social answer to racial problems, Black Studies received national attention in the 1960s and 1970s. The image of Black Studies programs became increasingly negative as a result of poorly conceived and administered examples. If Black Studies programs are to be continued, a distinction is needed between Afro-American programs as an academic discipline and as a partial remedy to social ills. In the former context, these studies should have a core and courses in methodology, while the integrity of the program should be immune to compromises by administrators, faculty, and students (54). Some research could be profitably expended to indicate which existing programs could meet these standards, and recommendations for others could be made after an analysis of what had made a difference in the best Black Studies programs. If findings concerning the viability of Black Studies programs from an academic standpoint turn out to be largely negative, the question of whether the programs should be continued merely as recruitment devices should be faced. Basic to answering that question in turn would, of course, be data indicating whether or not these programs have indeed been effective as recruitment devices.

Vital to constructively using any of the data related to special minority group recruitment is an answer to the simple question: What have been the effects of affirmative action on other special admissions policies on the presumed beneficiaries themselves? It is one thing to research the effect of such policies on the numerical proportions of minority students in institutions of higher education where they had not been, or were just barely, represented before; it is an entirely different matter to determine whether the special measures used have benefitted minority students.

Some solid, initial research has been done here, and the resulting findings should be followed up. One study, "Race Relations at Harvard," (49) finds that many black students feel that, because of their admission on the basis of affirmative action policies, their academic abilities are doubted by their peers, the faculty, and the administrators. They feel conflicts about the negative

aspects of affirmative action policies, yet they are reluctant to argue against them, all of which increases their self-doubt and insecurity. The study indicates that even the basic integrative aspect of such policies is in doubt: minority students at Harvard were found tending to cluster together in dining halls and extracurricular activities, and, in such settings, to foster an environment of racial exclusiveness (49).

If this be the case at Harvard, where affirmative action policies may be presumed to have been carried out under quite good conditions, analogous situations elsewhere are worth examining. Objective research should give some answer to the question of whether increasing the number of minority students at an institution has proven effective in itself to further the goals of racial diversity within the student body and relative integration of minority groups into academic mainstreams. It may be found that increases by themselves may only exacerbate the problems, which would, of course, raise questions about the future of affirmative action programs in college admissions; on the other hand, it may be found that these policies can be successful it used moderately in conjunction with others which are not yet generally known.

Projecting Effects of Federal Budget Cuts on Goals of Title IX Sex Discrimination Regulations

Attempts to have women admitted to previously all-male institutions of higher learning appear to have been successful in the main over the past two decades, so that there is no evident need for much further research to determine how women as students can be integrated into campus life where they were previously barred, as in the case of blacks. Nor are there reports of women at such institutions clustering together in dining halls or pursuing exclusively all-female extra-curricular activities in any fashion which threatens the goal of such measures. The matter of equitable employment of women in higher education, on the other hand, is a serious but different one, and will be noted later.

Still within the context of women as students, there are some areas in which Title IX policies appear to be counter-productive. Implementing Title IX, like enforcing Section 504 of the Vocational Rehabilitation Act, which deals with access for the handicapped to buildings, has proven to be much more expensive than anticipated (13). As funds become tighter, the cost of compliance with Title

IX regulations is causing some schools to drop certain athletic programs rather than comply. This has been given as a direct or indirect reason for eliminating some varsity sports at (among others) University of Colorado, Yale University, Colorado State University, and the University of California at Berkeley. The direct connection is the expense or difficulty in providing comparable programs for the "other" sex; the indirect connection is that the extra expense in providing equal opportunities to both sexes may force schools to drop other existing programs for both sexes. As an example of the former, the University of Maryland dropped men's football, tennis and swimming at its Eastern Shore campus; as an example of the latter, the University of Colorado dropped men's and women's swimming and gymnastics (40).

Such a trend obviously works against the intent of the regulations. Research could profitably be done to determine to what extent the reduction in funds is likely to cause the elimination of programs for both sexes and thus lessen opportunities in general. The significance of such investigations may, of course, be modified, if the courts confirm that Title IX applies only to educational programs which receive direct federal funds (44). This would substantially diminish the overall impact of Title IX in this context.

Achieving Desired Increases in Female and Minority-Group Representation in Faculty and Administrative Appointments

The effect of Title IX and affirmative action measures on faculty and administrative appointments needs in-depth investigation and evaluation. While there is no question but what such appointments have numerically increased over the past two decades, there is considerable question as to the relative quality of such appointments (44). The very nature of academic hierarchies makes qualitative implementation within a short period of time inherently difficult. Tenured positions are obviously more valuable than non-tenured ones; at the same time, the number of years set as a norm before tenure is granted militates against rapidly awarding tenured positions to achieve group equality. The same thing is true of promotions to associate and full professor rank. Exceptions have been made here, but some research appears to be justified on the effectiveness of both incentives and sanctions on achieving qualitative, as well as quantitative, increases in female and minority-group representation--i.e., proportionate ones in the desired higher levels of faculty appointments.

Approaching the same subject matter from a different direction, we might well ask: if years before tenure and time-in-grade before promotion are thought of as assuring a better quality of instruction and research at institutions of higher learning, is it not likely that making exceptions to assure quota-meeting by whatever name may potentially be damaging to that quality? This would involve the researcher in very sensitive areas of faculty evaluation. Institutional rules may, in fact, prevent or limit much of the desired research in this area. This, however, does not change the fact that, since federal policy has made use of both affirmative action and Title IX, hard data in this area would be useful to policymakers.

The matter of proportionate quality in administrative appointments may be a bit easier to approach. Generally speaking, the time and experience requirements for higher positions are flexible, and while these may be affected by state job-security regulations, those rules are not nearly so rigid as the ones protecting tenure. Of the major obstacles facing the researcher dealing with higher-level faculty appointments, the most serious one facing the same researcher concerned now with higher-level administrative appointments is the problem of determining to what extent female and minority-group appointments which appear to have been made on the basis of less in the way of experience requirements than comparable male, minority-group appointments are due to an attempt to comply with regulations, as opposed to recognition of exceptional talent. In this corner of institutional research, it may be prohibitively difficult to obtain sufficient data to come to secure conclusions. Once again, however, the importance of the issue makes the attempt worth risking.

An easier, more direct, and quite useful type of study in this area would involve making correlations between the threat and/or applications of federal sanctions and the corresponding increase or lack of increase in female and minority-group appointments at both higher faculty and administrative levels. This would yield only quantitative information, but this would be valuable in itself and furnish a good starting basis for research directed beyond this into more qualitative dimensions.

III. POST-SECONDARY PREPARATION OF ELEMENTARY AND SECONDARY SCHOOL TEACHERS

Curriculum Assessment in Teacher Education

The issue of how much "pedagogy" and how much "basic subject matter" should be included in teacher education has been debated hotly, but with rather more heat then light, for half a century; however, there are solid reasons why this and related issues should be thoroughly researched in the 1980s (8). There has been something of a glut in the preparation of elementary and secondary school teachers nationwide within the last decade, overcoming the teacher shortage of the early 1960s, although there has been a strong demand for teachers in certain fields, notably special education. With declining enrollments suggesting a drop in funding for teacher education, it appears particularly necessary that the remaining funds be invested in a way which will insure that the necessarily smaller number of teachers nationwide will be given the best possible preparation at colleges and universities. While a thorough study of the effectiveness of different components of teacher education would have been worthwhile in 1935, it is imperative that such a study be undertaken now. Many recently developed research techniques using computers are far more able than methods of earlier decades to contribute to settling disputed points in this issue (24).

While research designs for such projects may vary somewhat, there is no substitute for studying directly the needs felt by teachers in elementary, middle, and secondary education. Teachers practicing within school systems are above and away the best qualified to indicate how effective the education they have received has proven for the jobs they are expected to do. The review of felt needs should thus include an evaluation by practicing teachers of their teacher-education courses (methods, foundations of curriculum, etc.) and a simultaneous evaluation by them of the subject-matter courses taken by them in the areas in which they are teaching. "Interaction research" has been undertaken over the last few years but primarily in the context of correlating different variables in student preparation, aptitude, and reception to different methods of instruction (42,43). The desirability of further research of this type is not questioned, but making teacher-education institutions react with the results of their teaching, as perceived by teachers in real-life situations, would appear to be even more critical.

In this connection, it would also be to the point to include a concurrent study of the perceptions and conclusions of elementary and secondary school administrators regarding the relative importance of teacher-education courses and subject-matter courses in the preparation of teachers within their individual schools or school systems.

Certification Requirements and Competency Testing

The certification of elementary, middle and secondary school teachers, as a means of assuring that only qualified persons may engage in the education of young people, relates to higher education in the sense that certification is based in large part on the preparation which teachers have acquired at post-secondary institutions. If it appears that the elements of teacher education should be changed, then certainly standards for certification should be changed. There appears to be widespread public feeling that present methods of certification are not achieving their goal and that the quality of teachers in public schools needs improving. In the "Eleventh Annual Gallup Pool of the Public's Attitudes Toward Public Education" (1979), respondents were asked to rate the public schools and were then asked what "are the main things that a school has to do" in order to achieve a top rating. The item most frequently mentioned was "improve the quality of teachers." More specific questions elicited the opinion that teachers should not only be well qualified but "should be required to pass state board examinations before they are hired as well as at regular intervals thereafter" (20).

What this points to is some sort of examination of the type currently called "competency testing." There is, in fact, a growing movement among the states to include teacher competency testing requirements in certification regulations, and a monograph is now available which attempts to chart a realistic course for teacher education using competency examinations as a component (34). The whole movement is criticized by the NEA, which notes:

> The latest "quick fix" being seized upon by test-happy state and local school boards is fraught with unfairness--and doesn't get to the root of the problem (43a).

Since post-secondary institutions are going to be preparing grade school teachers with an eye to their certification, it makes sense for them to undertake some research on the efficacy of competency examinations and to examine for validity the objections of critics of the concept, such as those of the NEA.

The methodology for evaluating the efficacy of competency testing is so much in doubt that it would have to be largely formulated by the researchers themselves. There are obvious similarities but important differences in likely question responses on the matter of curriculum assessment, as discussed in the section above, and on the matter of competency testing. In the former context, that of simply weighing elements in a teacher's post-secondary preparation, there is no inherent threat to the teacher as respondent. In an analogous survey regarding competency testing, however, the respondent may be influenced by the implicit threat of being required to take such an examination, i.e., feelings of having to take competency tests themselves if they become required could easily color the responses of practicing teachers. There are undoubtedly ways around this, and a starting point might be to present competency testing as a possible future certification element to replace others which the respondent could rate as less relevant to teaching performance. While the former type of survey is more nearly ideal from a researcher's point of view because it stays relatively clear of immediately felt vested interests on the part of respondents, the second is probably more relevant to actual conditions of the coming decade if a choice must be made between the two: competency testing is a very live issue and should be understood in all its ramifications at institutions of higher education which prepare teachers. Still, prior curriculum assessment could serve as a starting point in evaluating the post-secondary preparation of teachers, with results of this assessment used in further research on competency testing.

Professional Educational Preparation for Constructive Approaches to U.S. Cultural Diversity

The fact that some attempts to ameliorate racial tensions in the late 1960s and 1970s by modifying school curricula fell far short of expectations does not change the fact that the United States is still an ethnically and culturally diverse society with unsolved problems. Its educational system demands teachers and other educational personnel who are trained to carry out professional tasks in a wide variety of settings and with full understanding of the significance of multiculturalism for meaningful education (26).

In the 1980s wide variations in the extent and degree to which equal and adequate educational opportunities are available to American youth still exist. Great disparities and inadequacies still attend educational provisions for groups not in the cultural mainstream. Elimination of as much of this condition as possible will require post-secondary institutions to produce educators who are adequately prepared and favorably inclined to work with young people of different ethnic groups or cultural identities.

Part of the problem may be coped with in ways which do not have much to do with future research efforts: simply the furthering of more knowledge and understanding of different ethnic, religious, and cultural groups may contribute to a desire on the part of educators on all levels to help young members of the sub-groups maintain their identity while themselves contributing to and enjoying advantages supplied by mainstream American life. Still, a start has been made in suggesting educational research in this area (27), and the scope can be profitably expanded. At the moment, it seems desirable for research projects to have grade-school age groups as the focal point for obtaining much of the data sought, but the point should be to carry what is learned back to post-secondary institutions to augment teacher education. There have been efforts to approach this problem since the early Glazer and Moynihan study, Beyond the Melting Pot (21), appeared twenty years ago, but a systematic examination needs to be undertaken to determine what has worked, what has not worked, and what might work if tried, towards the goal of maintaining the cultural diversity which enriches the American mainstream, while enabling young people of minority ethnic, religious and cultural groups to attain a level of education commensurate with their abilities. When more is known about content and method for educators to deal with aspects of cultural diversity in American education, colleges and universities engaged in teacher education can modify or expand their training efforts accordingly.

IV. OTHER ISSUES

Impact of Intercollegiate Athletics on Academic Standards

Media attention to intercollegiate athletics has generated a certain public awareness of the issue of non-academic activities which are supposed to complement or

support academic ones but which compete with them as well. No systematic research worthy of the name was found in this area during the course of this study, although there are oblique allusions to the problem under the heading of "retention" following "recruitment," as in a 1981 poll of college presidents on critical issues confronting their institutions (13). It is, of course, asking rather much to expect spokesmen for post-secondary instutions publicly to entertain the question of whether emphasis on athletics may have some damaging effect on academic standards at the very time their institutions are engaged in fierce competition to recruit athletes.

Basic research needs to be done on the total scope of athletic recruiting and efforts to maintain athletes in good standing sufficient to allow them to compete. Data on the nature and scope of these recruiting efforts will, of course, raise ethical questions for further consideration. At the moment it is widely believed that the success of athletic teams is absolutely necessary to assure strong alumni support of institutions of higher learning, but concrete research could be done to demonstrate to what extent this correlation, perceived by faculty members and administrators of post-secondary institutions, actually exists. Some quantitative data here would put questions of academic/athletic financing in some perspective: Is there an actual cost-benefit ratio between athletic expenditures which generate team victories and alumni contributions which justifies increasing such expenditures up to given points, or not? Results of this research might well be found appalling in some academic circles, but they should contribute to making discussion of the inherent problems more rational.

More difficult to approach, but quite valuable to know, would be data concerning the "shading" of academic standards for athletes and the results for both the academic careers of the athletes in question and the maintenance of academic standards. The matter of special admissions is currently fairly open and aboveboard: it should not be difficult to research the variety of means by which students considered particularly valuable to the school are admitted on a different basis than others. What happens then is less clear: theoretically in most instances, students admitted because of their special value to the school, rather than because they meet set standards competitively, are expected to maintain academic good standing with or without the aid of special tutoring. It would probably be quite difficult to find out with compelling accuracy how much pressure is exerted directly or

indirectly on instructors to maintain athletes in good standing, but it is likely that at least something of value could be learned from such a study. Fuller studies of what proportions of students specially admitted in this context actually complete academic careers in good standing would be useful in helping to expose crass abuses if, in fact, they exist.

The efficacy of special tutoring could be profitably studied within limits--on the level of what proportion of athletes receiving what concentration of special tutoring have been able to maintain academic good standing. It would, of course, be close to impossible to determine in individual cases with much accuracy how much the special tutoring, as opposed to subtle or unsubtle pressure on instructors, has helped to maintain students' gradepoint averages, but overall there might well be a correlation between institutional investments in special tutoring and results achieved. Here, too, a bit of basic cost-benefit analysis should be possible.

What Guidelines, If Any, Should Be Established to Address Problems Relating to Growing Industry-University Collaboration?

While collaborative efforts have been undertaken in the past, in view of federal budget cuts and declining enrollments they are believed to become more prevalent in the future. Much of the literature on this topic is threat-predicting in tone, tending to assume that industrial-academic collaboration will undermine the independence of the university. On the other hand, it seems warranted to observe at the outset that charges concerning the influence of the "military-industrial complex" on academia have been made before, particularly with reference to large government contracts for military-related research during the Vietnam War. It may be recalled that during the main years of that war, 1965-1972, the universities were actually locations of very outspoken criticism of governmental policy--contracts or no contracts. Precisely because of the conflicting evidence, attempts at objectively defining the nature and scope of corporate influence on post-secondary institutions of education as the result of mergers are important.

Questions raised thus far under this heading include: the future of academic freedom, corporate influence over the direction and methodology of university research, the profit motive of business versus the educational mission of academia, possible new restrictions on the publication

and exchange of scientific information, the right of a university to sell its publically created and perpetuated resources and reputation to private interests, and the compatibility of the interests of multinational corporations with those of the public interest and national welfare (36,37).

Again, because most of the existing literature is threat-perceptive rather than optimistic regarding the changes assumed to follow from increased academic-industrial cooperation, the questions above are phrased in the same tendentious, negative fashion in which they are found in articles published so far on this issue. Still, the questions raised are real ones, although they may be given quite different answers from the ones anticipated by those who raised them. For example, since industries are felt to be the beneficiaries of the free-market economy more than other groups in the eyes of some of the critical researchers, the assumption appears to follow that a result of corporate influence will be the promotion of free-enterprise philosophy and the suppression of less favorable views of laissez-faire economics--a turn of events perceived as a threat to academic freedom.

On the other hand, it appears possible to argue that with advocates of free enterprise being represented so sparsely in some institutions and disciplines and the very possibility of employing high-profile advocates of minimal government in doubt within some departments, that a little external influence in the direction of supporting free-enterprise views would increase the scope of philosophic debate at these schools and thus contribute to the freer expression of views.

In the same vein, discussion of the profit motive of business versus the educational mission of academia implies that academia is more quality-oriented in its choice of what programs to offer and continue, while business is more interested in larger numbers, a view implicit in the criticism of computer-assisted instruction as a "school-as-factory" approach voiced by computer-managed instruction advocates (see first section of this study) (2,37). This may be true, but it surely remains to be proven. Surely, the trend towards MBO (Management by Objective) and the felt need for mighty increases in CHP (Credit Hour Production), to justify requests for larger appropriations from state legislatures is obvious in state institutions of post-secondary education, which theoretically should be more shielded from a need to resort to a "business" mentality than private institutions.

Research on these and related issues should attempt to isolate business-mentality trends in academia which may be independent of the results of corporate influence; then demonstrate the degree, if any, to which these trends are furthered by corporate influence; and finally attempt to assess whether such influence is, in fact, damaging to academic independence.

It is worth keeping in mind, however, that the impact of business on academia resulting from an infusion of industrial funds to support research may be less than anticipated. National Science Foundation data, as reported in Chemical and Engineering News in 1980 were put in the following chart form for an article in Physics Today (41):

U.S. R & D Performance in 1979
(Billions of 1979 dollars)

Type of Research or Development	Industry	Non-Profits	University[a]	Government	Total
Basic research	1	1	4	1	7
Applied research	7	1	2	2	12
Development	29	1	1	4	35
Total	38[b]	2[b]	7	7	54

a) Includes Federally Funded R&D centers.
b) Totals do not always add up, because of rounding.

On the basis of these existing funding ratios, the author draws the following conclusion:

> Since most of the funding for university basic research is already derived from Federal tax revenues (to which corporations give up about half of their pre-tax earnings), it is difficult to imagine company managements justifying to their stockholders (or for that matter to themselves) the expenditure of even

> a fraction as many basic research dollars in universities as they do in their own organizations. Furthermore, if the companies supported university research to the tune of, say, 10% of their own basic research budget, it would provide at most only a 3% increase in university research funding. (41)

And so, contrary to the expectations of those who feat corporate influence and of those who might welcome it in academia, it is possible that what convergence of business and academic interests may occur will have relatively little influence on what basic research is undertaken in universities, let along what is taught and who teaches it. These considerations notwithstanding, if it should be ascertained that industrial-academic mergers do, in fact, contain potential threats to the integrity of institutions of higher education, either under the general heading of loss of academic independence or that of diluting standards to accommodate the profit motive, some further research could be done on the feasibility of guidelines to deal with such mergers. It is possible that there are enough instances of corporate-academic merging in which academic integrity has been maintained that principles for workable guidelines can be arrived at inductively both with regard to their typical content and with regard to the decision-making process which will construct and implement them.

Effects of Faculty Unionization

Eight to ten years ago, when it appeared that faculty unionization in post-secondary institutions was a likely national trend, negative predictions concerning results of such a development were outlined in publications of University Professors for Academic Order (UPAO). The contrasting assumptions of those advocating campus unions were fairly well known and continue to be. They stress the raising of faculty salaries and, in general, the independence of faculties in dealing with administrations over such matters as workload, fringe benefits, and tenure.

Since then, there have been many tendentious pronouncements on both sides, but an objective examination of the actual effects of unionization at colleges and universities still needs to be made. Just as the negative

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predictions concerning the effects of corporate-academic mergers noted above are, in effect, hypotheses and an examination of them can profitably serve as starting points for assessing the pros and cons of increased corporate-academic collaboration, so also a list of pessimistic predictions, such as that given by Dr. Russell Kirk in March 1975 could serve well to outline the questions which should be answered about faculty unionization in higher education (28a).

Has, in fact, leadership in questions of curriculum and instruction shifted from individual faculty members and organizations such as faculty senates to union committees, or have unions tended to rest content without attempting to exert influence in these areas? Has teaching and research, in fact, become more ideological at such institutions, as a result of a need for faculty members to conform lectures and writings to views approved by union leadership, or have unions refrained from formulating ideological statements and attempting to have these used as standards in teaching and publication? Overall, has academic freedom suffered as a result of union activity on campuses; have unions instead sought to promote academic freedom; are there mixed results; or "none of the above"?

This sort of examination could be done through questionnaire and interviewing techniques. As is the case with several of the other sensitive items suggested in this study, it would be necessary to guarantee anonymity to respondents and to pay some attention to the nature of minority positions taken among them. In this type of research, intensity of response should be considered along with frequency of numbers in attempting to assess impact. It is quite possible that majorities of respondents will have noted little or no threat to, or improvement in, their teaching and research environments, while significant changes may be measured from responses by a minority which has felt an impact.

These, then, are the most critical issues facing, or, let us say, posing opportunities for meaningful post-secondary educational research in the 1980s. On some of them, it will be quite difficult to do definitive research, but the point is that much more can be known about these issues, and research findings can contribute substantially to our understanding of post-secondary education even if final answers are not forthcoming.

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48. Silvern, Leonard C., "Anasynthesis Revisited: Systems Engineering in a Time of Educational Lethargy," Educational Technology, January 1980, pp. 40-6. Examines effectiveness of this method of analysis, synthesis, modeling, and simulation over the last twenty years for design of new instructional systems.

49. Skerry, Peter, "Race Relations at Harvard," Commentary, Vol. LXXI, No. 1, Jan. 1981, pp. 62-64. Casts doubt on effectiveness of special measures used thus far to integrate black students into the mainstream of the university.

50. Stevens, Dorothy J., "Computers, Curriculum, and Careful Planning," Educational Technology, Vol. XXI, November 1981, pp. 21-24. Good brief but balanced presentation of CAI and CMI approaches to classroom technology.

51. - -, "How Educators Perceive Computers in the Classroom," AEDS Journal, Spring 1980, pp. 221-232. Documents high level of interest but feelings of inadequacy on the part of K-12 instructors and administrators concerning computer use.

52. Toll, John S., "Strategic Planning: An Increasing Priority for Colleges and Universities," Change, Vol. XIV, No. 4, May/June 1982, pp. 36-7. Faces the fact that, while forecasting is not exactly predicting, it is the only basis for strategic planning in higher education.

53. U. S. Department of Commerce, Bureau of the Census. School Enrollment: Social and Economic Characteristics of Students, October 1978. Current Population Reports, Series P-20, no. 346. Washington: Bureau of the Census, October 1979.

54. Williams, Kenny J., "The Black Studies Syndrome," Change, Vol. XIII, No. 7, Oct. 1981, pp. 30-37. Dispassionate, analytical approach to proper place of Black Studies in academic life; highly recommended.

55. Winne, P. H., "Experiments Relating Teachers' Use of Higher Cognitive Questions to Student Achievement," Review of Educational Research, Vol. 49 (1979), pp. 13-50. Presents findings to indicate that low-level factual questions may do more to stimulate cognitive growth than higher level questions.

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